

PART 1 GENERAL

1.1 GENERAL SPECIFICATIONS

- .1 THE LOCATION, ROUTING AND ELEVATIONS OF ALL NEW AND EXISTING SERVICES AND UTILITIES AS SHOWN ON THE DRAWINGS ARE TO BE CONSIDERED AS APPROXIMATIONS ONLY. VERIFY THE EXACT LOCATIONS, ROUTINGS AND ELEVATIONS OF ALL SERVICES PRIOR TO COMMENCING WORK, AND ASSUME RESPONSIBILITY FOR LAYING OUT ALL WORK. THE CONTRACTOR SHALL RETAIN RESPONSIBILITY FOR ANY DAMAGE TO EXISTING SERVICES AND UTILITIES.
- .2 ALL ASPECTS OF THE INSTALLATION MUST COMPLY WITH THE MOST STRINGENT OF THE APPLICABLE BUILDING CODES, LOCAL REGULATIONS, AND BY-LAWS. BEFORE PROCEEDING WITH THE WORK, OBTAIN APPROVED DRAWINGS AND SPECIFICATIONS FROM THE AUTHORITIES HAVING JURISDICTION.
- .3 PROVIDE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS AND APPROVALS, PAY ALL RELATED REQUIRED FEES, AND ARRANGE FOR ALL INSPECTIONS RELATED TO THE PERFORMANCE OF THE SPECIFIED WORK.
- .4 PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLETE THE WORK AS SHOWN AND AS SPECIFIED, SO AS TO LEAVE THE OWNER WITH A COMPLETE AND FUNCTIONING SYSTEM. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND C.S.A. APPROVED, UNLESS SPECIFICALLY NOTED OTHERWISE. ALL SIMILAR EQUIPMENT AND OR MATERIALS SHALL BE BY THE SAME MANUFACTURER.
- .5 ALL CUTTING AND PATCHING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. EXISTING EXPOSED SURFACES SHALL BE RETURNED TO AN "AS-FOUND" CONDITION ACCEPTABLE TO THE OWNER.
- .6 PROVIDE ALL REQUIRED ACCESS PANELS WITH SUITABLE FIRE RATINGS FOR THE WALL OR CEILING THAT THEY ARE BEING INSTALLED IN.
- .7 CONTRACTOR SHALL COORDINATE THE WORK WITH OTHER CONTRACTORS IN ORDER TO AVOID CONFLICTS.
- .8 NEATLY STORE ALL MATERIALS, AND CLEAN UP REFUSE ON A REGULAR BASIS. PROTECT AND MAINTAIN ALL WORK UNTIL THE PROJECT HAS BEEN COMPLETED AND TURNED OVER TO THE OWNER.
- .9 THE INSTALLATION SHALL BE COMPLETELY TESTED, DEMONSTRATING THAT THE EQUIPMENT AND SYSTEMS INSTALLED ARE PERFORMING IN THE MANNER INTENDED.
- .10 REVIEW THE OPERATION AND MAINTENANCE OF THE SYSTEMS WITH THE CONTRACT ADMINISTRATOR AND PROVIDE WRITTEN AND/OR VERBAL INSTRUCTIONS AS REQUIRED.
- .11 FURNISH CERTIFICATES CONFIRMING THAT THE WORK HAS BEEN INSTALLED TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
- .12 NO CERTIFICATE ISSUED, PAYMENT MADE, OR PARTIAL OR ENTIRE USE OF THE SYSTEMS BY THE OWNER, SHALL BE CONSTRUED AS ACCEPTANCE OF DEFECTIVE WORK OR MATERIALS.

1.2 ELECTRICAL SPECIFICATIONS

- .1 REFER TO BID OPPORTUNITY DOCUMENTS.
- .2 PROVIDE FOR A COMPLETE AND WORKING INSTALLATION AS HEREIN SPECIFIED AND AS SHOWN ON THE DRAWINGS.
- .3 THE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE, PROVINCIAL AND MUNICIPAL CODES AND REGULATIONS.
- .4 COORDINATE ALL TELEPHONE CONDUIT RUNS WITH TELEPHONE UTILITY BEFORE INSTALLATION BEGINS.
- .5 ARRANGE FOR, AND COORDINATE, ROUGH-IN AND FINAL INSPECTIONS WITH INSPECTION AUTHORITIES, CONSULTANT AND THE BUILDING CONTRACT ADMINISTRATOR.
- .6 ALL EQUIPMENT SUPPLIED UNDER THIS CONTRACT SHALL BE NEW AND CSA APPROVED.

1.3 EXAMINATION

- .1 EXAMINE THE ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS TO ENSURE THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT. REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR PRIOR TO SUBMISSION OF TENDER.

1.4 SUPERVISION

- .1 SUPERVISE THE WORK AT ALL TIMES THROUGH A RESPONSIBLE AND COMPETENT JOURNEMEN ELECTRICIAN / SUPERVISOR.
- .2 FULL COOPERATION SHALL BE SHOWN WITH OTHER TRADES TO FACILITATE INSTALLATIONS AND TO AVOID DELAYS IN CARRYING OUT THE WORK.

1.5 ACCURACY OF DATA

- .1 DRAWINGS ARE SCHEMATIC; EXACT LOCATIONS, DISTANCES, LEVELS AND OTHER DIMENSIONS SHALL BE GOVERNED BY THE BUILDING AS CONSTRUCTED.
- .2 OUTLETS OR EQUIPMENT SHALL BE MOVED TO ANY POINT WITHIN A 10' RADIUS WHEN RELOCATION IS REQUESTED BY THE CONTRACT ADMINISTRATOR BEFORE THE WORK HAS BEEN SUBSTANTIALLY COMPLETED, WITHOUT ADDITIONAL COST.
- .3 BRANCH CIRCUIT WIRING SHALL BE INSTALLED WITH CIRCUITS ARRANGED EXACTLY AS SHOWN ON THE DRAWINGS. CONDUIT AND CABLE RUNS MAY BE MODIFIED TO SUIT THE INSTALLATION.

1.6 SHOP DRAWINGS

- .1 PROVIDE A MINIMUM OF SEVEN COPIES OF SHOP DRAWINGS FOR REVIEW BY THE CONTRACT ADMINISTRATOR. THE SHOP DRAWINGS MUST BE ASSEMBLED INTO COMPLETE BROCHURES, WITH NO LOOSE SHEETS. UNASSEMBLED SUBMISSIONS WILL BE RETURNED AS INCOMPLETE.
- .2 THE REVIEW OF THE SHOP DRAWINGS IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THE REVIEW SHALL NOT MEAN APPROVAL OF THE DETAILED DESIGN INHERENT IN THE EQUIPMENT, THE RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR. THE REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REMAIN RESPONSIBLE FOR CONFIRMING AND CORRELATING THE DIMENSIONS ON THE JOBSITE, AND FOR INFORMATION THAT PERTAINS TO THE FABRICATION PROCESS, CONSTRUCTION TECHNIQUES, AND INSTALLATION DETAILS, AND FOR COORDINATING ALL WORK OF THE RELATED SUB-TRADES.
- .3 FABRICATION OF EQUIPMENT SHALL NOT COMMENCE UNTIL SHOP DRAWINGS OF SUCH EQUIPMENT HAVE BEEN REVIEWED BY THE CONTRACT ADMINISTRATOR. TWO SETS SHALL BE SUBMITTED WITH LOCAL INSPECTION DEPARTMENT APPROVAL WHERE REQUIRED.
- .4 THE CONTRACTOR SHALL REVIEW ALL MECHANICAL SHOP DRAWINGS REQUIRING ELECTRICAL CONNECTION AND COORDINATE WIRING WITH DIVISION 15.
- .5 REQUIRED SHOP DRAWINGS
 - LIGHT FIXTURES, LAMPS, BALLASTS AND CONTROL SYSTEMS
 - ELECTRICAL DISTRIBUTION (CDPS, PANELBOARDS, BREAKERS, ETC)
 - MAIN SERVICE ENTRANCE DISTRIBUTIONS
 - PANELBOARDS
 - ELECTRIC HEATING EQUIPMENT AND CONTROLS
 - EMERGENCY LIGHTING EQUIPMENT
 - WIRING DEVICES (RECEPTACLES, SWITCHES, ETC)
 - MOTOR STARTERS
 - CONTACTORS
 - DISCONNECT SWITCHES
 - FIRE ALARM SYSTEM

1.7 AS-BUILT DRAWINGS

- .1 KEEP A RECORD SET OF DRAWINGS ON THE SITE AT ALL TIMES RECORDING ANY CHANGES THAT MAY OCCUR. SUBMIT THESE DRAWINGS TO THE CONTRACT ADMINISTRATOR UPON COMPLETION OF THE WORK. AS-BUILTS SHALL INCLUDE CIRCUITING OF NEW AND EXISTING EQUIPMENT TO REMAIN.
- .2 AT THE COMPLETION OF THE INSTALLATION, PROVIDE FOUR AS-BUILT AUTOCAD DRAWINGS AND ONE ELECTRONIC AUTOCAD COPY ON CD FOR REPORT PURPOSES. PROVIDE FOUR SETS OF OPERATION AND MAINTENANCE MANUALS. PAY ALL COSTS ASSOCIATED WITH THE PRODUCTION OF THE AS-BUILT DRAWINGS AND THE MANUAL. SUBMIT THE DOCUMENTS TO THE CONTRACT ADMINISTRATOR FOR REVIEW AND MAKE ANY REQUESTED CHANGES BEFORE DELIVERING FINAL DOCUMENTS TO THE CONTRACT ADMINISTRATOR.
- .3 SUBMIT A CERTIFICATE OF INSPECTION FROM THE LOCAL INSPECTION AUTHORITY UPON COMPLETION OF WORK AND INCLUDE WITH AS-BUILT DRAWINGS.
- .4 THE CONTRACT ADMINISTRATOR RESERVES THE RIGHT TO RECOMMEND THAT A PORTION OF THE CONTRACT FUNDS BE WITHHELD PENDING SUBMISSION OF ACCEPTABLE AS-BUILT DRAWINGS.

1.8 TESTING

- .1 THE ELECTRICAL INSTALLATION SHALL BE COMPLETELY TESTED DEMONSTRATING THAT THE EQUIPMENT AND SYSTEMS INSTALLED PERFORM IN THE MANNER INTENDED.

1.9 GROUNDING

- .1 THE ENTIRE INSTALLATION SHALL BE GROUNDED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE AND AS SHOWN ON DRAWINGS.

1.10 WORKMANSHIP

- .1 INSTALL EQUIPMENT, CONDUIT AND CABLES IN A WORKMANLIKE MANNER TO PRESENT A NEAT APPEARANCE TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR. INSTALL CONDUIT AND CABLE RUNS PARALLEL AND PERPENDICULAR IN CHASES, BEHIND FURRING OR ABOVE CEILINGS. IN AREAS WHERE SYSTEMS ARE TO BE EXPOSED, INSTALL NEATLY AND GROUP TO PRESENT A TIDY APPEARANCE.
- .2 INSTALL EQUIPMENT AND APPARATUS REQUIRING MAINTENANCE, ADJUSTMENT OR EVENTUAL REPLACEMENT WITH ADEQUATE CLEARANCES AND ACCESSIBILITY FOR SAME.
- .3 INCLUDE, IN THE WORK, ALL REQUIREMENTS SHOWN ON THE SHOP DRAWINGS OR MANUFACTURERS' INSTALLATION INSTRUCTIONS.
- .4 REPLACE WORK UNSATISFACTORY TO THE CONTRACT ADMINISTRATOR WITHOUT EXTRA COST.
- .5 USE OF CLIPS FOR SECURING AC-90 TO CEILING SYSTEM IS PROHIBITED.
- .6 ALL CONDUITS MUST BE CLIPPED TO STRUCTURAL CONCRETE BY MEANS OF ANCHORS OR SUPPORTED BY UNISTRUT HANGERS AS CLOSE TO UNDERSIDE AS POSSIBLE. TYE WRAPS FOR WIRE HANGING AND FASTENING IS NOT ACCEPTABLE. PERFORATED STRAPPING IS ALSO UNACCEPTABLE. ALL ELECTRICAL COMPONENTS MUST BE SUPPORTED INDEPENDENTLY.

PART 2 MATERIALS AND INSTALLATION

2.1 OUTLET BOXES

- .1 OUTLET, JUNCTION AND SWITCH BOXES SHALL BE GALVANIZED PRESSED STEEL OF SIZE AND TYPE TO SUIT EACH INDIVIDUAL APPLICATION.
 - .2 OUTLETS SHALL NOT BE LOCATED ANYWHERE ON THE OUTSIDE CURTAIN WALL. OUTLETS SHOWN THUS SHALL BE MOUNTED ON THE NEAREST DIVIDING WALL 2' FROM OUTSIDE WALL, OR NEAREST FURRED OUT COLUMN.
 - .3 PROVIDE ALL REQUIRED ACCESS PANELS WITH SUITABLE FIRE RATINGS FOR THE WALL OR CEILING THAT THEY ARE BEING INSTALLED IN.
- 2.2 WIRING METHODS
- .1 UNLESS OTHERWISE SHOWN ON THE DRAWINGS, ALL WIRE SHALL BE COPPER, MINIMUM #12 AWG WITH 90 DEGREES CELSIUS X-LINK INSULATION. WIRING TO BE INSTALLED IN CONDUIT (INCLUDING WIRING ON ROOF DECK FLUTES WHERE APPROVED).
 - .2 WIRING IN CONCRETE OR MASONRY CONSTRUCTION SHALL BE INSTALLED IN STEEL ELECTRICAL METALLIC TUBING (EMT). PROVIDE A SEPARATE GROUNDING CONDUCTOR IN EMT CONDUIT RUNS EMBEDDED IN CONCRETE SLABS. CONDUITS INSTALLED IN AREAS EXPOSED TO MOISTURE SHALL HAVE WATER-TIGHT FITTINGS.
 - .3 ALL WIRING IN FINISHED AREAS SHALL BE CONCEALED. ALL CONDUCTORS AND CONDUITS SHALL BE RUN PERPENDICULAR OR PARALLEL TO THE BUILDING CORE WALLS.
 - .4 CONDUIT AND WIRING SHALL BE GROUPED WHERE POSSIBLE AND CLIPPED IN A NEAT AND WORKMANLIKE MANNER.
 - .5 AC-90 CABLE TO BE USED FOR DROPS FROM CONDUIT SYSTEMS TO RECESSED LIGHTING FIXTURES IN ACCESSIBLE CEILINGS OR OUTLET BOXES IN STEEL STUD WALLS ONLY. HOME RUNS SHALL BE IN CONDUIT. MAXIMUM RUN OF AC-90 IN ACCESSIBLE CEILING SPACE SHALL BE 5'-0".
 - .6 CONDUIT RUNS SHALL BE INSTALLED AND INSPECTED BEFORE AC-90 RUNS ARE INSTALLED TO ENSURE CONFORMANCE WITH ITEM .5 HEREIN.
 - .7 ALL AC-90 USED FOR DROPS SHALL BE RUN TIGHT TO DECK AND FOLLOW LINES OF BREAMS AND BUILDING.
 - .8 ALL WIRING IN SERVICE AREAS TO BE IN SURFACE MOUNTED EMT. DO NOT RUN CONDUIT HORIZONTALLY ON WALLS, VERTICAL DROPS ONLY.

2.3 IDENTIFICATION OF EQUIPMENT

- .1 ALL EQUIPMENT SHALL BE IDENTIFIED WITH 38MM X 25MM WITH 6MM LETTERING (1/2" X 1" WITH 1/4" LETTERING) ENGRAVED LAMACOID NAMEPLATES INDICATING PANEL AND CIRCUIT NUMBER OR FIRE ALARM HORN DESIGNATION. LAMACOIDS SHALL BE EITHER SCREWED OR RIVETED IN PLACE. WITH EXCEPTION TO RECEPTACLES AND LIGHTING SWITCHES, SELF ADHESIVE TYPE IS NOT ACCEPTABLE. LAMACOIDS SHALL BE WHITE LETTERING ON RED FACE FOR EMERGENCY AND FIRE ALARM DEVICES AND WHITE LETTERING ON BLACK FACE TO NORMAL POWER DEVICES AND COMMUNICATION PANELS.
- .2 ALL EQUIPMENT SHALL BE IDENTIFIED PER BID OPPORTUNITY DOCUMENTS.

2.4 MECHANICAL EQUIPMENT WIRING

- .1 PROVIDE STARTERS (MINIMUM SIZE NEMA 1) AND WIRING FOR ALL HEATING, VENTILATING AND PLUMBING EQUIPMENT UNLESS SPECIFIED OTHERWISE.
- .2 CONTRACTOR TO OBTAIN WIRING DIAGRAM AND PERFORM ALL POWER WIRING FOR THE MECHANICAL EQUIPMENT.
- .3 PROVIDE CONTROL WIRING FOR ALL MECHANICAL EQUIPMENT AS INDICATED. REFER TO MOTOR SCHEDULE FOR CONTROL WIRING REQUIREMENTS.
- .4 REFER TO THE MECHANICAL DRAWINGS FOR THE EXACT LOCATION OF MECHANICAL EQUIPMENT REQUIRING AN ELECTRICAL CONNECTION.
- .5 WHERE CONDUIT IS TO BE INSTALLED IN DESIGNATED EXPOSED AREAS (OPEN BEAM CEILING, ETC), CONTRACTOR TO COORDINATE EXACT INSTALLATION LOCATION WITH OTHER CONTRACTORS AND CONTRACT ADMINISTRATOR. ALL CONDUITS SHALL BE INSTALLED TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.

2.5 PANELBOARDS

- .1 LOAD CENTRES ARE NOT ACCEPTABLE. PANELS SHALL BE COMPLETE WITH PANEL TRIM HAVING CONCEALED HINGES AND TRIM MOUNTING SCREWS, LOCKING DOOR WITH FLUSH CATCH. PROVIDE TWO KEYS FOR EACH PANEL. PROVIDE SPRINKLER HOOD ON ALL PANELBOARDS.
- .2 BRANCH CIRCUIT BREAKERS SHALL BE BOLT-ON MOULDED CASE WITH THERMAL BREAKERS RATED AT 10,000A SYMMETRICAL OR AS INDICATED ON SINGLE LINE DRAWING.
- .3 AFFIX TYPEWRITTEN DIRECTORY TO THE INSIDE OF THE PANELBOARD INDICATING LOADS CONTROLLED BY EACH CIRCUIT INCLUDE COPY IN OPERATION AND MAINTENANCE MANUALS.
- .4 PANELBOARDS TO BE SURFACE OR RECESSED MOUNTED AS INDICATED.
- .5 PROVIDE BREAKER LOCK ON DEVICE FOR NIGHT LIGHTS AND FIRE ALARM CIRCUITS, AND PAINT BREAKER COLOUR RED.
- .6 PROVIDE BREAKER LOCK ON DEVICE FOR RTU-1.

2.6 CUTTING AND PATCHING

- .1 ARRANGE AND PAY FOR ALL CUTTING AND PATCHING AS REQUIRED FOR THE ELECTRICAL INSTALLATION.
- .2 PROVIDE APPROPRIATE FIRESTOP AT ALL FIRE WALL PENETRATIONS. ACCEPTABLE MANUFACTURERS: DOW CORNING, FIRESTOP SYSTEMS (ELASTA-SEAL) OR G.E. SILICONE.
- .3 REFER TO ARCHITECTURAL SPECIFICATIONS FOR PRODUCT AND INSTALLATION DETAILS.

2.7 DISTRIBUTION

- .1 GENERAL ARRANGEMENT AND SIZE OF COMPONENTS SHALL BE AS SHOWN ON THE DRAWINGS.
- .2 ALL DISTRIBUTION EQUIPMENT IS TO BE COMPLETE WITH LOCKING DOOR AND SPRINKLER HOODS.
- .3 PROVIDE SHORT CIRCUIT AND CO-ORDINATION STUDY SEALED BY A PROFESSIONAL ENGINEER LICENCED TO PRACTICE IN THE PROVINCE IN WHICH THE WORK IS BEING PERFORMED WITH DISTRIBUTION SHOP DRAWINGS.

2.8 EMERGENCY AND EXIT LIGHTING

- .1 NEW EXIT LIGHT FIXTURES TO MATCH EXISTING UNLESS OTHERWISE NOTED. UNITS TO BE ONE OR TWO SIDED AS INDICATED UNITS TO BE PROVIDED WITH FULL PANEL (HIGH BRIGHTNESS) LED'S, WITH MINIMUM 100,000 HOUR LIFE RATING AND BE COMPLETE WITH DIRECTIONAL ARROWS, AS SHOWN ON THE DRAWING. PROVIDE AC AND DC POWER.
- .2 WIRING SHALL BE MINIMUM #12 AWG. PROVIDE #10 AWG WHERE REQUIRED TO ATTAIN 2% (OR LESS) VOLTAGE DROP, UNLESS OTHERWISE NOTED. ALL WIRING IN EMT.
- .3 CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING BATTERY BANK SIZE AND CAPACITY TO PROVIDE A MINIMUM OF 60 MINUTE BACK-UP.
- .4 ACCEPTABLE MANUFACTURER IS LUMACELL.
- .5 ALL EXIT SIGNS TO BE CSA C860 APPROVED.

2.9 FIRE ALARM SYSTEM

- .1 ALL NEW FIRE ALARM DEVICES ARE TO MATCH EXISTING MIRCOSM SYSTEM.
- .2 ALL NEW FIRE ALARM DEVICES ARE TO BE INSTALLED IN CONDUIT.
- .3 PROVIDE NEW SIGNAL CIRCUITS AS REQUIRED FOR NEW DEVICES.
- .4 PROVIDE FIRE ALARM VERIFICATION REPORT.

NO.	REVISIONS	DATE	BY
3	REVISED PRIOR TO TENDER	11/07/07	G.T.
2	ISSUED FOR TENDER	08/08/07	RN/TT
1	ISSUED FOR FINAL REVIEW	07/16/07	RN/TT
0	ISSUED FOR OWNER'S REVIEW	01/31/07	GH/TT

CONSULTANT

These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design professional has not entered into a contract. Any use of the drawing, disk or electronic data without the expressed written permission of Tower Engineering Group is strictly prohibited.


The contractor is responsible to verify all dimensions with conditions on the site and report discrepancies to Tower Engineering for adjustment. All prints to be returned.

TOWER PROJECT NO. 6194




TOWER ENGINEERING GROUP
 208 - 897 CORYDON AVE. WINNIPEG, MB R3M 0W7
 TEL: (204) 925-1150 FAX: (204) 925-1155
 EMAIL: towereng@towereng.ca WEB: www.towereng.ca

SEAL



SEAL



PROJECT

**CITY OF WINNIPEG
CENTENNIAL SWIMMING POOL**

**90 SINCLAIR STREET
WINNIPEG, MB**

DRAWING

**ELECTRICAL
SPECIFICATIONS**

DESIGNED:	LAN	SHEET E-3.0 REVISION R-3
DRAWN:	LAN	
CHECKED:	TT	
SCALE:	AS NOTED	
DATE:	JUL16/07	
PROJECT NO.:	6194	